

JAPANESE

[JP,2002-142182,A]

CLAIMS DETAILED DESCRIPTION TECHNICAL FIELD PRIOR ART EFFECT OF THE INVENTION
TECHNICAL PROBLEM MEANS DESCRIPTION OF DRAWINGS DRAWINGS

[Translation done.]

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

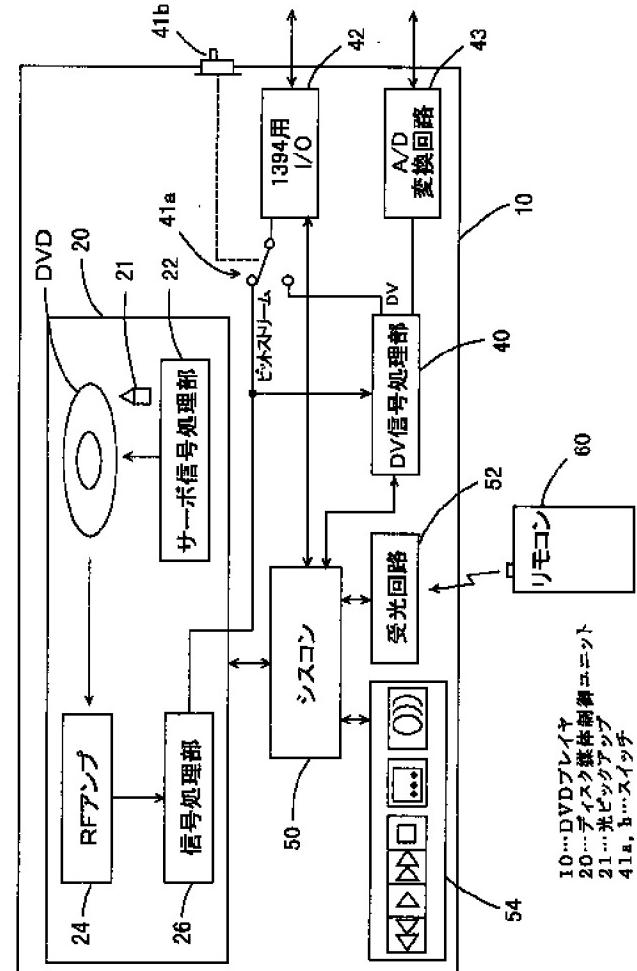
[0001]

[Field of the Invention] This invention relates to the recording and reproducing device and DVD deck of a disc medium which are especially constituted so that connection of an external instrument is possible about the recording and reproducing device and DVD deck of a disc medium.

[0002]

[Description of the Prior Art] In the DVD (Digital Versatile Disk) deck, the recording and reproducing device which can be recorded and reproduced is spreading like DVD-RAM or DVD-RW in recent years. With the fast improvement in the processing speed in a personal computer, the data of DVD-RAM etc. is read into a personal computer, and the man in the street can perform video edit now freely. It has the input/output port usually based on the IEEE1394 standard in the DVD deck, the data of the image recorded on DVD to the

Drawing selection Representative draw



[Translation done.]

personal computer linked to the input/output port concerned or a sound is encoded in DV form, and it is ability ready for sending at a computer. For this reason, it is possible by receiving the data of DV form via the input/output port concerned in a computer, and storing in a hard disk for video edit to be attained using the data of the DV form concerned, and to view and listen to an image in real time.

[0003]The art of on the other hand performing video edit to JP,10-74381,A in a personal computer based on the data in which the digital recording is made is indicated. In the art, while outputting the video signal of an analog in playback equipment, the digital data in which the position on the magnetic tape of each image is shown is outputted. And if the scene of choice is chosen and a start and end time is specified, looking at the reproduction based on the above-mentioned analog video signal in a personal computer, the time code at the start/end time concerned will be acquired as the above-mentioned digital data. The capture also of the picture at this start/end time is carried out. He can perform dubbing directions, a user grasping the scene of choice by the picture which was carried out in this way and carried out the capture, and playback equipment can pull out the head of the tape position as dubbing directions based on the data at the above-mentioned start time etc., and can perform dubbing.

[0004]

[Problem(s) to be Solved by the Invention]In the DVD deck mentioned above, the data of DV form outputted from the input/output port based on an IEEE1394 standard is outputting the image and the sound with a refreshable speed simultaneously with data acquisition in the above-mentioned personal computer. Therefore, when transmitting the image and sound of length for 10 minutes to a personal computer from a DVD deck, it will take 10 minutes. On the other hand, also in the playback equipment mentioned later, although digital data is recorded on magnetic tape, Analogue conversion of the video signal inputted into a personal computer is carried out, and it will take 10 minutes for incorporating the image for 10 minutes also in the time of selection of the scene of choice at the time of dubbing. This invention was made in view of the aforementioned problem, raises a data transfer rate substantially, and aims at offer of the recording and reproducing device of a disc medium usable as external memory storage of a computer, and a DVD deck.

[0005]

[Means for Solving the Problem]In order to attain the above-

mentioned purpose, an invention concerning claim 1, A disc-medium control unit which performs either or combination of read-out of digital data and writing from a disc medium which can record digital data, Change digital data for reproducing either or combination of digital data for the above-mentioned disc-medium record, an animation, and a sound in real time mutually, and A generable digital data conversion method, Input/output port which secures connection with an external instrument via a predetermined path cord, and outputs and inputs digital data, A course which performs direct communication between disc-medium control unit concerned and input/output port in securing two-way communication of the above-mentioned disc-medium control unit and the above-mentioned input/output port, It has composition possessing a switching means controlled to perform communication in one course of the courses which make the above-mentioned digital data conversion method intervene between disc-medium control unit concerned and input/output port.

[0006]In an invention concerning claim 1 constituted as mentioned above, It has a disc-medium control unit, a digital data conversion method, and input/output port, and digital data from a disc medium to read-out or a disc medium of digital data which can record digital data can be written in in a disc-medium control unit. Digital data for reproducing either or combination of digital data for the above-mentioned disc-medium record, an animation, and a sound in real time in a digital data conversion method can be changed mutually, and can be generated. To input/output port, connection with an external instrument can be secured via a predetermined path cord, and digital data can be outputted and inputted in this connected state.

[0007]It has a switching means, in order that this invention may control an input-and-output mode of digital data further, A course which performs direct communication between disc-medium control unit concerned and input/output port when the switching means secures two-way communication of the above-mentioned disc-medium control unit and the above-mentioned input/output port, It controls to perform communication in one course of the courses which make the above-mentioned digital data conversion method intervene between disc-medium control unit concerned and input/output port.

[0008]That is, data in the state where data of a state outputted from a disc-medium control unit at the time of data output was outputted by control of a switching means

from the above-mentioned input/output port, or it was changed by a digital data conversion method is outputted from the above-mentioned input/output port. Data in the state where data of a state inputted from input/output port at the time of data input was inputted into the above-mentioned disc-medium control unit, or it was changed by a digital data conversion method is inputted into the above-mentioned disc-medium control unit. By this composition, a data transfer rate of the above-mentioned input/output port and data input/output speed to an external instrument connected can transmit data as data output speed of a disc-medium control unit at an external instrument, as long as it is larger than data input/output speed of the above-mentioned disc-medium control unit.

[0009]Therefore, even if it is a case where data for reproducing an image and a sound is generated in real time, and the same transfer time as reproduction real time of data requires for it in the generated data concerned by a digital data conversion method, If read-out data from the above-mentioned disc-medium control unit is outputted as it is by switching control of the above-mentioned switching means from input/output port, data can be transmitted at high speed, without being influenced in any way at playback real time. Since the above-mentioned disc-medium control unit and an external instrument perform direct communication via the above-mentioned input/output port, a recording and reproducing device of this disc medium functions just like external memory storage.

[0010]Here a disc medium treated with a disc-medium control unit, What is necessary is just to be able to record digital data, and it is large scale and DVD can apply this invention to real time also to CD and MO of a suitable thing, MD, etc. for the purpose of recording data for playing an image and a sound. Of course, it is not caught by kind of other standards of what has suitable DVD-RAM, i.e., DVD-R, DVD-RW or CD-R, and CD-RW in a meaning that read-out and writing are made, but this invention can be applied. What is necessary is just to be able to perform either or combination of read-out of digital data and writing from these disc media in a disc-medium control unit, What is necessary is just to constitute servomechanism etc. which rotate an accessible optical pickup and a magnetic head, and a disc medium to a disc medium which is the target of read-out/writing as one unit.

[0011]What is necessary is just to be able to change digital data for reproducing either or combination of digital data for the above-mentioned disc-medium record, an animation, and

a sound in real time mutually in a digital data conversion method. As digital data for disc-medium record, MPEG form can be adopted, for example and digital video form can be adopted, for example as digital data for reproducing either or combination of an animation and a sound in real time.

[0012]In input/output port, what is necessary is to secure connection with an external instrument via a predetermined path cord, and just to be able to output and input digital data, and various ports can be adopted. Although it is suitable if a port of IEEE1394 standard conformity already used general-purpose is used as input/output port when applying this invention to a DVD deck etc., of course, input/output port of other standards, such as USB and Ethernet (registered trademark), is also employable.

[0013]As stated above, the usual DVD deck etc. come to function as being based on this invention also as external memory storage of an external instrument, but. As an example of composition for making it function on convenience more as external memory storage, the above-mentioned disc-medium control unit has considered an invention concerning claim 2 as composition read-out / whose writing speed of digital data are variable in a recording and reproducing device of a disc medium given in above-mentioned claim 1. In an invention concerning claim 2 constituted as mentioned above, speed which reads digital data in a disc-medium control unit, and speed to write in are variable. Namely, in order to play an image and a sound in real time, a disc-medium control unit drives with disk rotational speed called one X etc., but. An external instrument slack computer can make speed treating digital data quicker than this far, and disk rotational speed has become tens times. Then, in this invention, convenience as external memory storage can be raised more by enabling a drive of a disc-medium control unit at a speed of 2X or more which was unnecessary as a usual DVD deck, and constituting data from an external instrument so that input and output are possible at high speed.

[0014]An invention which starts claim 3 as an example of composition of the above-mentioned digital data conversion method, In a recording and reproducing device of a disc medium given in either above-mentioned claim 1 or claim 2, the above-mentioned digital data conversion method has considered data which consists of bit sequence data, a digital video signal, and a digital sound signal for disc-medium record as mutually convertible composition. In an invention

concerning claim 3 constituted as mentioned above, data which consists of bit sequence data, a digital video signal, and a digital sound signal for disc-medium record is changed mutually. That is, both sides with data which consists of bit sequence data, a digital video signal, and a digital sound signal for disc-medium record in an external instrument can be used.

[0015]In the above-mentioned switching means, what is necessary is just to be able to control to perform communication in either of the two above-mentioned course, and the composition is various. An invention which starts claim 4 as the suitable example of composition is considered as composition which controls a course of the above-mentioned communication by a switch operational [switching means / above-mentioned] in a user in a recording and reproducing device of a disc medium given in either above-mentioned claim 1 - claim 3. In an invention concerning claim 4 constituted as mentioned above, it is [user] operational in a switch and a course of the above-mentioned communication is controlled by this switch. A user namely, by having composition which controls a communicative course by wiring so that one flow of the courses of the above-mentioned communication may be secured in a switch, and changing a switch, It can be chosen easily whether it is used as a device which makes a regenerative signal according whether a recording and reproducing device of a disc medium concerning this invention is used as external memory storage to digital data like before output and input.

[0016]Here, various modes can adopt the above-mentioned switch. That is, MEKASUITCHI which changes physical wiring of a communicative course most simply can be adopted, and it may be made to change wiring electrically using switching operation of a transistor. If in this case remote control operation which a user uses constitutes this switching control further so that execution is possible, convenience will improve more. Although the user can choose easily whether it is a course of which communication with this switch, it is suitable if it specifies whether a course of which communication is chosen further. For example, it is possible to carry out the character representation of the communication display near [projection] a switch in MEKASUITCHI, and it possible that a communicative course is clearly shown by display position of LED, color, the display on a liquid crystal display, etc. in a case where a transistor is used etc.

[0017]An invention which starts claim 5 as other examples

of composition for controlling to perform communication in either of the two above-mentioned course, In a recording and reproducing device of a disc medium of a statement, to either above-mentioned claim 1 - claim 4, the above-mentioned switching means, While outputting a signal for OSD displays for making a user choose a course of the above-mentioned communication, it has composition which controls a course of the above-mentioned communication by receiving selection performed a user recognizing the OSD display concerned visually.

[0018]In an invention concerning claim 5 constituted as mentioned above, while outputting a signal for OSD displays for making a user choose a course of the above-mentioned communication, selection performed a user recognizing the OSD display concerned visually is received. And a communicative course is controlled according to received contents. That is, the user can choose whether it is used as a device which makes a regenerative signal according whether a recording and reproducing device of a disc medium which starts this invention using an OSD display is used as external memory storage to digital data output and input like before.

[0019]Although a signal for OSD displays is outputted from a recording and reproducing device of a disc medium, here, Since a recording and reproducing device of a disc medium concerning this invention outputting an analog video signal etc. to a TV apparatus etc. which are connected as an original function, and having a function of displaying an image is assumed, What is necessary is just to constitute a signal for OSD displays for making a user choose a communicative course as this analog video signal so that an output is possible. Selection performed recognizing an OSD display visually is convenient if execution of it is enabled with the remote control, and if it constitutes a course of selected communication so that an OSD display may show clearly, it is preferred.

[0020]An invention which starts claim 6 as other examples of composition for controlling to perform communication in either of the two above-mentioned course, In a recording and reproducing device of a disc medium of a statement, to either above-mentioned claim 1 - claim 5, the above-mentioned switching means, While it is possible to perform the above-mentioned external instrument and two-way communication via the above-mentioned input/output port, it has composition which controls a course of the above-mentioned communication by receiving directions from the

external instrument concerned via the two-way communication concerned.

[0021]In an invention concerning claim 6 constituted as mentioned above, it is possible to perform the above-mentioned external instrument and two-way communication via the above-mentioned input/output port. And a course of the above-mentioned communication is controlled by receiving directions from the external instrument concerned via the two-way communication concerned. That is, a recording and reproducing device of a disc medium which starts this invention in an external instrument is accessed, it constitutes so that a communicative course may be directed from the external instrument concerned, and also in a recording and reproducing device of a disc medium, a communicative course is controlled according to this access.

[0022]Especially, when an external instrument is a general-purpose personal computer etc., What is necessary is just to prepare for the personal computer concerned a driver etc. who enable the access concerned, and the user can operate a recording and reproducing device of a disc medium concerning this invention as external memory storage by installing the driver concerned in a personal computer. It more specifically constitutes so that a command for external memory storage control may be outputted from an external instrument, It is realizable by constituting so that the above-mentioned switching means may acquire a command for the external memory storage control concerned via input/output port, and constituting so that input and output of data may be performed according to a command for the external memory storage control concerned.

[0023]A DVD control unit in which an invention concerning claim 7 performs either or combination of read-out of digital bit stream data and writing from DVD, Change the above-mentioned digital bit stream data and a digital video data mutually, and A generable digital data conversion method, High-speed serial interface which connects external computer paraphernalia so that two-way communication is possible, A course which performs direct communication between DVD control unit concerned and high-speed serial interface in securing two-way communication of the above-mentioned DVD control unit and the above-mentioned high-speed serial interface, It has composition possessing a switch controlled to perform communication in one course of the courses which make the above-mentioned digital data conversion method intervene between DVD control unit concerned and high-speed serial interface. namely, the above -- it is effective even if it realizes as a recording and

reproducing device of a disc medium which has concrete composition.

[0024]

[Effect of the Invention]As explained above, while data output refreshable in real time is possible for this invention, data can also be transmitted at high speed, without being influenced at reproduction real time. Since the above-mentioned disc-medium control unit and an external instrument perform direct communication via the above-mentioned input/output port, the recording and reproducing device of this disc medium functions just like external memory storage. According to the invention concerning claim 2, the convenience as external memory storage can be raised more. According to the invention concerning claim 3, it becomes possible to use both sides with the data which consists of the bit sequence data, digital video signal, and digital sound signal for disc-medium record in an external instrument. According to the invention concerning claim 4, it can be chosen easily how the recording and reproducing device of the disc medium concerning this invention is used.

[0025]According to the invention concerning claim 5, it can be chosen easily how the recording and reproducing device of the disc medium concerning this invention is used.

According to the invention concerning claim 6, the convenience at the time of operating the recording and reproducing device of a disc medium as external memory storage improves. According to the invention concerning claim 7, while data output refreshable in real time is possible, data can also be transmitted at high speed, without being influenced at reproduction real time. Since the above-mentioned disc-medium control unit and an external instrument perform direct communication via the above-mentioned input/output port, this DVD deck functions just like external memory storage.

[0026]

[Embodiment of the Invention]Hereafter, the embodiment of this invention is described based on a drawing. Drawing 1 shows the system which consists of a TV apparatus connected to the external instrument slack personal computer (PC) connected to the DVD player concerning one embodiment of this invention, and the DVD player, and the DVD player. In the figure, it is connected with PC70 by DV cable via I/O for 1394 based on an IEEE1394 standard, and DVD player 10 is connected with TV apparatus 80 by the RCA cable via the RCA jack.

[0027]Although a general-purpose personal computer can

constitute PC70, in order to perform two-way communication, being connected with DVD player 10 via the above-mentioned DV cable in this embodiment, it is provided with I/O for 1394 based on an IEEE1394 standard. Others are equipped with the keyboard and mouse as the display and input device as an output unit, Recognizing this display visually, by operating a keyboard etc., various applications can be performed, a hard disk drive can be accessed by control of OS, or the ** I/O above-mentioned [1394] can be accessed, and read-out/writing of data can be performed.

[0028]TV apparatus 80 receives a broadcasting electric-wave via the antenna which is not illustrated, By being able to output the image and sound which are broadcast by performing predetermined signal processing, and also performing predetermined signal processing to the video signal and audio signal of an analog which were received via the above-mentioned RCA jack, The image and sound based on the signal outputted from above-mentioned DVD player 10 can be outputted. After receiving a broadcasting electric-wave and performing predetermined signal processing, the signal concerned can be outputted via an RCA jack, and it can also be made to record on DVD in DVD player 10. That is, DVD player 10 can record an image etc. to reproduction and DVD of the image etc. which are recorded on DVD, and has the same function as the usual DVD player.

[0029]Drawing 2 is a block diagram showing the internal configuration of DVD player 10. DVD player 10 is provided with the disc-medium control unit 20 which reads the information, including an animation/speech information, a title, a region code, etc., by which the digital recording was carried out to DVD which is an optical recording medium as a data bit stream, or writes it in in the figure. Namely, the disc-medium control unit 20, The servo signal treating part 22 which makes a prescribed position drive the optical pickup 21 by sending out a control signal to a focus servo etc., RF amplifier 24 which amplifies the reading signal from the optical pickup 21, and generates a predetermined control signal, and the digital data currently recorded out of the amplified signal are restored, and it comprises the signal processing part 26 which changes and outputs to a data bit stream. These apparatus operates under control of the system component 50, and the data bit stream recorded on DVD is outputted from the input/output terminal of the disc-medium control unit 20.

[0030]If the above-mentioned signal processing part 26 can perform signal processing also in the case of data writing and a data bit stream is inputted from the above-mentioned input/output terminal, The servo signal treating part 22 and the optical pickup 21 driving, and adjusting an output with processing of the signal processing part 26 to a prescribed position, it irradiates with laser and digital data can be recorded on DVD. In the servo signal treating part 22 of the disc-medium control unit 20, It is possible to change disk rotational speed, i.e., read-out/writing speed of digital data, by control of the system component 50, and in outputting and inputting a data bit stream from I/O42 for 1394 directly so that it may mention later, it performs read-out/writing at high speed.

[0031]To the input/output terminal of the above-mentioned disc-medium control unit 20, the signal wire from the DV signal processing part 40 is connected, and the signal wire concerned branches and is connected also to one stationary contact of the switch 41a. The above-mentioned DV signal processing part 40 is a circuit which can output and input two or more kinds of signals, as mentioned later, and the signal wire which outputs and inputs the data of DV form is connected to the stationary contact of another side of the above-mentioned switch 41a. The switch 41a has a traveling contact which chooses either of the signals from the two above-mentioned stationary contacts, and the traveling contact concerned is connected to the ** 42 [above-mentioned / 1394 / I/O]. This switch 41a is actually constituted by the switch 41b projected in the prescribed position on the case surface of DVD player 10, and the flow line by the above-mentioned traveling contact is changed by a user's switch change.

[0032]The DV signal processing part 40 is a circuit group which performs various signal processing based on the data of DV form outputted from the data bit stream and I/O42 for the above 1394 which are outputted from the input/output terminal of the above-mentioned disc-medium control unit 20, and outputs by changing into various data modes. There is an MPEG recovery as one of the processings performed by these circuit groups. That is, digital data is recorded on the above-mentioned DVD in MPEG form, and the disc-medium control unit 20 outputs this MPEG data as a data bit stream. If this data bit stream is inputted into the DV signal processing part 40, the DV signal processing part 40 will output the restoration signal concerned to the A/D conversion circuit 43 while it restores the moving image information and speech information before compressive

conversion and gets a video output and an audio output. [0033] After this A/D conversion circuit 43 changes the digital data inputted into analog data and performs predetermined amplification etc., it is a circuit which outputs an analog signal to the above-mentioned RCA jack. Therefore, the video output and audio output which were restored [above-mentioned] are changed into an analog video signal and an analog voice signal by the A/D conversion circuit 43, and an image and a sound are outputted with above-mentioned TV apparatus 80 in the state in which an output is possible. The above-mentioned DV signal processing part 40 outputs various information, including a region code etc., to the system component 50 among the data obtained on the occasion of the MPEG recovery of the above-mentioned data bit stream. The system component 50 performs processing for making impossible reproduction of the medium by which reproduction is forbidden by the area based on these information, or outputting information, including a title name, cast information, etc.

[0034] On the other hand, the DV signal processing part 40 also has the DV codec which changes the data bit stream of MPEG form, and the signal of DV form mutually. The video signal and audio signal by which the MPEG recovery was carried out [above-mentioned] are encoded to a digital signal, and this DV codec can be outputted as data of DV form. The data of DV form inputted can be decoded and the data bit stream of MPEG form can be outputted. Input and output of the DV form concerned are performed via the stationary contact of another side of the switch 41a as mentioned above. Thus, since the data bit stream which the above-mentioned disc-medium control unit 20 outputted, and the data of DV form are inputted into the stationary contact of the switch 41a, respectively, The signal mode outputted from I/O42 for the above 1394 when a user operates the switch 41b changes, Even if it inputs the signal of which mode into I/O42 for said 1394, when a user operates the switch 41b, the digital recording of the data bit stream can be carried out to DVD.

[0035] Since it can say that the above-mentioned data bit stream has read the data recorded on DVD as it is, it can be said that DVD player 10 is functioning as external memory storage of PC80 in this state. Although the above-mentioned DV form is also recordable on HDD of PC80 of course, it can also reproduce in real time and it can be said that DVD player 10 is functioning as a certain DVD deck from the

former. Thus, it is specified whether the switch 41b is changed to which function in the character, as it is shown in drawing 3 in the projection neighborhood which operates the switch 41b, since the function of DVD player 10 is changed. As explained above, in this embodiment, the DV signal processing part 40 constitutes the above-mentioned digital data conversion method, the ** 42 [above-mentioned / 1394 / I/O] constitutes the above-mentioned input/output port, and the above-mentioned switch 41a and b constitute the above-mentioned switching means.

[0036]The system component 50 performs processing corresponding to the command inputted via the ** 42 [the processing based on the signal inputted from the above-mentioned DV signal processing part 40, the motion control of the this DVD player 10 whole, and above-mentioned / 1394 / I/O], etc. That is, the inside of the system component 50 is equipped with the control circuit for controlling an external instrument while having ROM on which the predetermined control program was recorded with CPU which serves as a subject of data processing, and RAM used as a work area etc. As mentioned above under control by this system component 50, the disc-medium control unit 20 and the DV signal processing part 40 perform predetermined processing, and the output of an analog signal and the output of a digital signal based on the record data of DVD are performed. If the command for external memory storage control etc. which pointed to input and output of digital data, etc. via I/O42 for 1394 are received, input and output of digital data will be performed controlling the disc-medium control unit 20 and carrying out the high velocity revolution of the disk by the servo signal treating part 22.

[0037]The receiver circuit 52 and the navigational panel 54 are connected to the system component 50, Based on the predetermined control signal inputted from these receiver circuits 52 and navigational panels 54, the above-mentioned disc-medium control unit 20 and the DV signal processing part 40 are controlled to perform playback/stop of DVD, access to desired tracks, and selection of language, and to make a change of camera angle etc. It is possible for a user to operate the remote control 60 and the above-mentioned navigational panel 54, and to perform execution instruction of request processings, such as above-mentioned reproduction/stop.

[0038]In this embodiment, although DVD player 10 is shown as one gestalt of the recording and reproducing device of a disc medium, of course, this invention is also

applicable to the player which reproduces the animation/speech information recorded on other recording media to the playback equipment of what kind of recording medium which carries out and will be developed from now on which may adopt the composition which applies the recording and reproducing device of the disc medium concerning this invention. The predetermined driver is installed in the above-mentioned PC70, and DVD player 10 applied to this invention by control of the driver concerned can be recognized as external memory storage. Via I/O for 1394 of above-mentioned PC70, an output of the command for external memory storage control is possible for this driver, and a data bit stream is outputted and inputted following the command. That is, the data outputted from PC70 is recordable on DVD in DVD player 10, the data recorded on DVD can be read PC70 and DVD player 10 functions as external memory storage.

[0039]In the above-mentioned composition, a user chooses as any of a DVD deck and external memory storage as shown in drawing 1, where DVD player 10 and PC70 are connected, DVD player 10 is used. In using DVD player 10 as external memory storage, a user operates the switch 41b and moves projection of the switch 41b to the "external memory storage" side like drawing 3. In PC70, the above-mentioned driver is installed beforehand.

[0040]If the above-mentioned mouse etc. which were connected to PC70 in this state are operated and read-out from DVD player 10 is performed, the command for the above-mentioned external memory storage control will be transmitted to DVD player 10 via I/O for 1394. This command is acquired by the system component 50 via I/O42 for 1394 of DVD player 10, and it is recognized that the commands are read-out directions. The system component 50 makes the data bit stream of the data demanded from the above-mentioned input/output terminal output at this time while it controls the servo signal treating part 22 of the above-mentioned disc-medium control unit 20 and carries out the high velocity revolution of the DVD.

[0041]Since the flow is secured so that the direct entry of the input/output terminal concerned may be carried out to I/O42 for 1394 in the state of the switch 41b shown in above-mentioned drawing 3, Although the data bit stream concerned is transmitted with the protocol based on an IEEE1394 standard, it is transmitted to PC70 as a data bit stream. In PC70, the data bit stream concerned is received, and the data is used for HDD by the above-mentioned

driver's processing, storing. Also when writing in data from PC70, while it is the same and the command for the above-mentioned external memory storage control is interpreted with the system component 50, the disc-medium control unit 20 drives, and the data inputted via the ** 42 [above-mentioned / 1394 / I/O] is recorded on DVD.

[0042]On the other hand, in using DVD player 10 as a DVD deck, a user operates the switch 41b and moves the projection to the "DVD deck" side. It stands by at this time, performing application which reproduces the data of DV form inputted via the ** I/O above-mentioned [1394] in PC70 in real time. And if the above-mentioned remote control 60 is operated and DVD playback is performed, the system component 50 will control the above-mentioned disc-medium control unit 20, and a data bit stream will be outputted at the rate of usual.

[0043]While the data bit stream concerned is inputted into the DV signal processing part 40 at this time, it is changed and outputted to DV form. Although this output is inputted into the switch 41a, the data of DV form that above-mentioned the above-mentioned switch 41a was changed since the input terminal concerned and flow were secured is inputted into the ** 42 [above-mentioned / 1394 / I/O].

Then, although the data of the DV form concerned is transmitted with the protocol based on an IEEE1394 standard, it is transmitted to PC70 as a DV form. In PC70, by the above-mentioned driver's processing, the data of DV form is received and the above-mentioned application is reproduced based on the received data of DV form.

[0044]Thus, although the function of DVD player 10 can be changed only by a user changing the switch 41b in this embodiment, it is not restricted to MEKASUITCHI 41b not necessarily above as a technique which performs this switching control. Drawing 4 is a block diagram showing the internal configuration of DVD player 10 concerning a second embodiment of this invention. In the figure, the techniques with which a user performs an operation switch differ, and the change of the function of DVD player 10 is performed on a remote control. In this second embodiment, the gestalten of the switch differ as compared with a first embodiment of the above, and the composition of other portions is the same as that of a first embodiment.

[0045]That is, the switch 410a is a switching transistor switched by the level of the predetermined output port of the system component 50. It has the manual operation button 410b which a user operates the manual operation button

provided on the remote control 60, and changes the usual DVD deck and external memory storage besides a manual operation button of DVD player 10. The contents of operation of this manual operation button 410b are superimposed as a predetermined code signal by the infrared remote control signals which the remote control 60 outputs, and are outputted to them, and the infrared remote control signals are received in the receiver circuit 52 of DVD player 10. At this time, while the receiver circuit 52 restores to the above-mentioned code signal and the system component 50 receives the signal concerned to which it restored, it grasps that the user operated the deck button or the external button.

[0046] And when the system component 50 changes the switch 410a according to the button grabbing concerned, It is controlled whether the direct output of the data bit stream which the above-mentioned disc-medium control unit 20 outputs is carried out from I/O42 for the above 1394, or the data of DV form changed in the DV signal processing part 40 is outputted. Therefore, it can be chosen whether in operating PC70 and using DVD player 10, a user uses DVD player 10 as the deck by operating the manual operation button 410b of the remote control 60, or it is used as external memory storage.

[0047] It can also have composition which does not form the switch in which a user does a direct control like the above-mentioned switches 41b and 410b as composition for changing the function of DVD player 10. That is, since it processes after the system component 50 receives the above commands for external memory storage control, when accessing when DVD player 10 is used as external memory storage, a switch can be changed with reception of this command.

[0048] Drawing 5 shows some flows of control of the system component 50 in this third embodiment. This third embodiment is realizable in the same hardware constitutions as a second embodiment of the above, and like the above-mentioned switch 410a, by control of the system component 50, while execution has become possible, a switch-off substitute, In the usual state, the flow with the DV signal processing part 40 and I/O42 for 1394 is secured so that DVD player 10 may function as a DVD deck. In this composition, it has distinguished whether the system component 50 acquired data via the ** 42 [above-mentioned / 1394 / I/O] at Step S100 of drawing 5, and it is distinguished at Step S110 whether the acquired data concerned is the above-mentioned command for external

memory storage control.

[0049]When having acquired data at this step S100 is distinguished and it is distinguished that the data acquired at Step S110 is a command for external memory storage control, The system component 50 changes the above-mentioned switch 410a so that direct continuation of the above-mentioned disc-medium control unit 20 and I/O42 for 1394 may be carried out. And as operation of a first above-mentioned embodiment explained after Step S130, processing according to the acquired command is performed. Therefore, in this composition, even if a user does not change the function of DVD player 10 beforehand with a switch etc., when PC70 tends to use DVD player 10 as external memory storage, DVD player 10 functions as external memory storage automatically.

[0050]Drawing 6 is a block diagram showing the internal configuration of DVD player 10 concerning a fourth embodiment of this invention. In this embodiment, a user chooses how DVD player 10 is operated, recognizing visually the OSD display in above-mentioned TV apparatus 80. That is, since DVD player 10 is usually various functions, an OSD display shows a menu and various functions and setting out are made to perform in many cases, it is [how DVD player 10 is operated as 1 selections of the menu of this OSD display, and] selectable.

[0051]In the figure, DVD player 10 is provided with the OSD signal processing part 44, and the OSD signal processing part 44 is connected with the above-mentioned system component 50 at the RCA jack 45. The OSD signal processing part 44 is a circuit which the signal generated to OSD displays is inputted into the system component 50, superimposes a synchronized signal etc., and outputs the analog video signal for OSD displays. The remote control 60 is equipped with the menu button 411b, and the system component 50 outputs an OSD display signal by the pushing operation of the menu button 411b concerned.

[0052]At this time, it is possible to perform selection about the selections on a menu by the pushing operation of the manual operation button which is not further illustrated in the remote control 60, and the OSD signal for performing the OSD display for urging selection according to the manual operation button concerned is suitably outputted in the system component 50. Drawing 7 shows an example of the OSD display concerned. If a user does pushing operation of the menu button 411b of the above-mentioned remote control 60, the system component 50 will output the signal

for menu indications, the signal concerned will be inputted into the above-mentioned OSD signal processing part 44, and the analog signal for OSD displays will be inputted into above-mentioned TV apparatus 80.

[0053]As a result, in TV apparatus 80, a selectable menu is displayed like drawing 7. The "input-and-output change" item is also displayed as one of the selectable menu of this, If a user chooses the concerned "input-and-output change" item, as shown under drawing 7, a screen will change, and it can be chosen whether a user uses DVD player 10 as a DVD deck with the screen concerned, or it is used as external memory storage. If a user chooses either, the system component 50 will change the above-mentioned switch 411a suitably according to the contents of selection concerned, and it will be controlled whether it is made whether the direct continuation of the above-mentioned disc-medium control unit 20 and I/O42 for 1394 is made to be carried out, or to be connected via the DV signal processing part 44.

[0054]Thus, the course which performs direct communication between the disc-medium control unit concerned and input/output port in this invention in securing the two-way communication of a disc-medium control unit and input/output port, Switching control is carried out so that communication may be performed in one course of the courses which make the above-mentioned digital data conversion method intervene between the disc-medium control unit concerned and input/output port. Therefore, a data transfer rate can be raised substantially and the recording and reproducing device and DVD deck of a disc medium usable as external memory storage of a computer can be provided.

[Translation done.]